

ABSTRACT OF THE DISCLOSURE

A method is disclosed for forming high-quality high-crystallinity polycrystalline or monocrystalline thin semiconductor film. The method is capable of forming such a semiconductor film over a large area at low cost. An apparatus for practicing the method is also disclosed. To form a high-crystallinity large-grain polycrystalline film or monocrystalline thin semiconductor film on a substrate, or to produce a semiconductor device including a high-crystallinity large-grain polycrystalline film or monocrystalline thin semiconductor film disposed on a substrate, a low-crystal-quality thin semiconductor film is first formed on the substrate, and then focused-light annealing is performed on the low-crystal-quality thin semiconductor film thereby melting or semi-melting the low-crystal-quality thin semiconductor film. The focused-light annealing allows enhancement of crystallization that occurs when the melted low-crystal-quality thin semiconductor film is cooled, and thus the low-crystal-quality thin semiconductor film is converted into a high-quality polycrystalline (or monocrystalline) thin semiconductor film.

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